

What is claimed is:

1. A method for determining a time until completion for a charging process associated with a rechargeable battery, the method comprising the steps of:
 - a. providing a charger capable of coupling to the rechargeable battery, the charger comprising a means of processing data capable of identifying the rechargeable battery;
 - b. identifying a charging process for the rechargeable battery, the process comprising a plurality of charging states;
 - c. determining which of the plurality of charging states is being executed;
 - d. calculating a first time to completion for the state being executed;
 - e. calculating at least a second time to completion for at least one of the remaining states of the plurality of charging states; and
 - f. calculating the time to completion for the charging process by adding the first and the at least a second time to completion.
2. The method of claim 1, wherein each of the plurality of charging states is selected from the group consisting of trickle charging, rapid charging, initiation charging, and discharging.
3. The method of claim 1, wherein the plurality of charging states comprises trickle charging, rapid charging and discharging.
4. The method of claim 3, wherein the first time to completion comprises a predetermined estimate corresponding to the rechargeable battery.
5. The method of claim 4, wherein calculating a time to completion for the rapid charging state comprises the steps of:
 - a. subtracting an amount of energy stored in the rechargeable battery from a maximum energy capable of being stored within the rechargeable battery; and

b. dividing by a rapid charge rate.

6. The method of claim 4, wherein calculating a time to completion for the discharging state comprises the step of dividing a maximum energy capable of being stored within the rechargeable battery by a discharge rate.

5 7. The method of claim 4, further comprising the step of compensating for energy dissipated within the rechargeable battery pack due to self-discharge.

8. The method of claim 7, wherein compensating comprises:

a. reading a most recent battery usage time stored within the rechargeable battery;

b. determining a present time;

10 c. calculating an elapsed time;

d. dividing the elapsed time by a predetermined self-discharge rate;

e. subtracting a corresponding energy from an amount of energy stored within the rechargeable battery.